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10/572,595	10/24/2006	Keiichi Yano	287530US0X PCT	2913
22850	7590	02/08/2008	EXAMINER	
OBLON, SPIVAK, MCCLELLAND MAIER & NEUSTADT, P.C.			LI, MEIYA	
1940 DUKE STREET			ART UNIT	PAPER NUMBER
ALEXANDRIA, VA 22314			2811	
			NOTIFICATION DATE	DELIVERY MODE
			02/08/2008	ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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# Office Action Summary

Application No.

10/572,595

Applicant(s)

YANO, KEIICHI

Examiner

MEIYA LI

Art Unit

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☒ Responsive to communication(s) filed on 21 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 20 March 2006 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
  - 2) ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 8/21/07, 8/21/07, 8/21/07.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## **DETAILED ACTION**

### ***Priority***

1. Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Information Disclosure Statement***

2. The information disclosure statement filed on March 20, 2006 fails to comply with 37 CFR 1.98(a)(2), which requires a legible copy of each cited foreign patent document; each non-patent literature publication or that portion which caused it to be listed; and all other information or that portion which caused it to be listed. It has been placed in the application file, but the information referred to therein has not been considered.

### ***Drawings***

3. Figure 4 should be designated by a legend such as --Prior Art-- because only that which is old is illustrated. See MPEP § 608.02(g).
4. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the "at least one peripheral component" (claim 3, line 2) and "solder resist ink" (claim 7, line 2) must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate

prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

***Claim Rejections - 35 USC § 112***

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claims 1-7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.
7. The claimed limitation of "the co-fired substrate", as recited in claim 1, is unclear as to which co-fired substrate applicant refers.
8. The claimed limitation of "the aluminum nitride substrate", as recited in claim 1, is unclear as to which aluminum nitride substrate applicant refers.

9. The claimed limitation of "the substrate", as recited in claim 1, is unclear as to which substrate applicant refers.
10. The claimed limitation of "diodes for inhibiting reverse current, resistances, and thermistors", as recited in claim 3, is unclear how can a device inhibit a device.
11. The claimed limitation of "the resist film", as recited in claim 7, is unclear as to which resist film applicant refers.

***Claim Rejections - 35 USC § 103***

12. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

13. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

14. Claims 1, 2, 4, and 5, as best understood, are rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. (Pub. # US 2004/0262738 A1, published on December 30, 2004, filed on June 27, 2003) in view of Shinosawa et al. (Pub. # US 2002/0102441 A1, published on August 1, 2002).

As for claim 1, Lee et al. shows a light emitting apparatus 200 (Figs. 2B) comprising: an substrate 110; and a light emitting device 250 arranged on a front surface 112 of the substrate 110, wherein the front surface 112 of the substrate 110, on which the light emitting device 250 is arranged, and wherein the light emitting apparatus 200 further comprises a vapor-deposited metal film 130/132 and via holes 116/118, the vapor-deposited metal film 130/132 being arranged on the front surface 112 of the substrate around the light emitting device 250 and having a reflectivity of 90% or more with respect to light emitted from the light emitting device 250 (claim 4), and the via holes 116/118 penetrating the substrate from the front surface 112 ([0019], lines 1-3), on which the light emitting device 250 is arranged, to the rear surface 114 of the substrate 100 to thereby allow conduction to the light emitting device 250 from the rear surface 114.

However, Lee et al. fails to show the substrate is an aluminum nitride, and the front surface of the substrate is mirror-polished so as to have a surface roughness of 0.3  $\mu\text{m}$  Ra or less.

In the same field of endeavor, Shinosawa et al. teaches an aluminum nitride substrate 1, a surface 1a thereof is mirror-polished so as to have a surface roughness of 0.3  $\mu\text{m}$  Ra or less (Fig. 1; Abstract).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to include the mirror-polished aluminum nitride substrate with the surface roughness of 0.3  $\mu\text{m}$  Ra or less, as taught by Shinosawa et al., in the device of

Lee et al., with the motivation to improve the thermal conductivity and the mechanical strength of the device.

As for claim 2, the vapor-deposited metal film 130/132 comprises aluminum or silver (Lee: claim 4).

As for claim 4, Lee et al. as modified by Shnosawa et al. shows the aluminum nitride substrate carrying the light emitting device has a surface roughness of 0.1  $\mu\text{m}$  Ra or less.

As for claim 5, the light emitting device 250 is mounted on the substrate 100 (Lee: Fig. 2B).

The limitation that "by a flip chip assembly technique" is considered to be product-by-process claims. "[E]ven though product-by process claims are limited by and defined by the process, determination of patentability is based on the product itself. The patentability of a product does not depend on its method of production. If the product in the product-by-process claim is the same as or obvious from a product of the prior art, the claim is unpatentable even though the prior product was made by a different process." *In re Thorpe*, 777 F.2d 695, 698, 227 USPQ 964, 966 (Fed. Cir. 1985).

15. Claims 3, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al., in view of Shinosawa et al. as applied to claim 1 above, and further in view of Nakabayashi et al. (Pub. # US 2002/0167017 A1, published on November 14, 2002, filed on March 11, 2002).

As for claim 3, Lee et al. as modified by Shinosawa et al., shows a LED chip as the light emitting device 250 (Lee: [0027], lines 4-5).

However, Lee et al. as modified by Shinosawa et al. fail to show at least one peripheral component selected from the group consisting of diodes for inhibiting reverse current, resistances, and thermistors.

In the same field of endeavor, Nakabayashi et al. teaches at least one peripheral component 135 arranged on the substrate and selected from the group consisting of diodes for inhibiting reverse current, resistances, and thermistors ([0086], line 17).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to include at least one peripheral component selected from the group consisting of diodes for inhibiting reverse current, resistances, and thermistors, as taught by Nakabayashi et al., in the device of Lee et al. as modified by Shinosawa et al., with the motivation to prevent an accumulation of electrostatic charge in the device.

16. Claims 6 and 7, as best understood, is rejected under 35 U.S.C. 103(a) as being unpatentable over Lee et al. in view of Shinosawa et al., and further in view of Arai et al. (Pat. # 4,220,810, patented on September 2, 1980).

As for claims 6 and 7, Lee et al. as modified by Shinosawa et al. show the claim invention substantially, as applied to claim 1 above.

However, Lee et al. as modified by Shinosawa et al. fails to show a white resist film is arranged on an exposed front surface of the aluminum nitride substrate other than a region where the vapor-deposited metal film is arranged, wherein the resist film comprises a solder resist ink and is formed by screen printing method.

In the same field of endeavor, Arai et al. teaches a white resist film 13 is arranged on an exposed front surface of the aluminum nitride substrate other than a



region where the vapor-deposited metal film is arranged, wherein the resist film comprises a solder resist ink and is formed by screen printing method (Fig. 3; Col. 2, lines 6—65).

It would have been obvious to one of ordinary skill in the art, at the time the invention was made, to include the white resist film, as taught by Arai et al., in the device of Lee et al. as modified by Shinosawa et al., with the motivation to prevent solder bridging, to reduce solder pickup, to eliminate the oxidation or corrosion of metallization pattern and the electromigration, and to protect the substrate at the time of assembling.

### ***Conclusion***

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Ref's B and E-F are cited as being related to light emitting device.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MEIYA LI whose telephone number is (571)270-1572. The examiner can normally be reached on Monday-Friday 7:30AM-5:00PM Eastern Standard Time.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynne Gurley can be reached on (571) 272-1670. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

ML  
1/24/2008

  
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